



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,747	02/08/2001	Michio Tanimoto	S-2482	6897

7590 07/12/2002

SHERMAN & SHALLOWAY  
413 North Washington Street  
Alexandria, VA 22314

EXAMINER

OH, TAYLOR V

ART UNIT	PAPER NUMBER
1625	

DATE MAILED: 07/12/2002 4

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/778,747	TANIMOTO, MICHIO
Examiner	Art Unit	
Taylor Victor Oh	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 28 March 2001 .

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 1-4 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-4 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)  The proposed drawing correction filed on \_\_\_\_\_ is: a)  approved b)  disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)  The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)  All b)  Some \* c)  None of:

1.  Certified copies of the priority documents have been received.
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)  The translation of the foreign language provisional application has been received.

15)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)      4)  Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_ .  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)      5)  Notice of Informal Patent Application (PTO-152)  
3)  Information Disclosure Statement(s) (PTO-1449) Paper No(s)      6)  Other: \_\_\_\_\_

***Claim Rejections - 35 USC § 112***

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A symbol “ B” has been used in two different meanings: one is for bismuth, the other is an element selected from phosphorus, tellurium, and etc.; therefore, it is vague and indefinite. An appropriate correction is required.

A number of terms “occupying volume”, “ calcining temperature”, and “amount of the alkali metal element” are written. However, they are unspecified as to how much is for occupying the volume, what is the range of the temperature and is the amount of the alkali metal element. An appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Wada et al (WO98/24746) which is equivalent to Wada et al (U.S. 6,028,220).

Wada et al discloses a process for the preparation of acrolein and acrylic acid by carrying out the vapor phase catalytic oxidation of propylene with molecular oxygen or a gas containing molecular oxygen using a fixed bed multi-tubular reactor (see col. 1 ,lines 8-13). Furthermore, the reaction process for the production of acrolein and acrylic acid can be performed by introducing a mixture gas consisting of 1 to 10 % by volume of propylene as the starting material (see col. 8 ,lines 26-29).

In the process, a plurality of oxidation catalysts having a composition of the following formula is employed:  $Mo_aBi_bNi_cCo_dFe_fY_gZ_hO_x$  where Mo, Bi, Ni, Co, and Fe represent molybdenum, bismuth, nickel, cobalt and iron, respectively; Y is at least one element selected from the group of tin, zinc, tungsten, manganese, magnesium, antimony and titanium; Z is at least one element selected from the group of potassium, rubidium, thallium, and cesium ; a, b, c, d, f, g, h, and x represent the number of atoms of molybdenum, bismuth, nickel, cobalt , iron, Y, Z, and oxygen; a=12, b=0.1 to 7, c+d =0.5 to 20, f=0.5 to 8, g=0 to 2, h=0 to 1 and x is determined by the oxidized condition of each element (see col. 4 ,lines 13-29) in U.S. 6,028,220.

Moreover, the plurality of catalysts having different occupying volumes (see col. 2 ,lines 45-47) is set-up so as to form a catalyst layer into two or three parts depending on calcination temperature and time and the plurality of catalysts with an amount of at least 20 % by weight based on the sum of the supported catalyst(see col. 4 ,lines 40-41) in each of a plurality of reaction zones is arranged in such an order that the activity increases toward the outlet from the inlet of the material in the axial direction of the tube (see col. 8 ,lines 47-54). These are identical with the claims.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hammon et al (U.S. 5,264,625) discloses a process of the catalytic gas-phase oxidation of acrolein to acrylic acid in a fixed-bed reactor with contact tubes at an elevated temperature on catalytically active oxides from 260<sup>0</sup> to 300<sup>0</sup> C.

Hinnenkamp (U.S. 4,435,598) discloses a process for the catalytic oxidation of propylene to acrylic acid in the presence of an effective amount of hydroquinone. The reaction temperature is from 50 to 200<sup>0</sup> C. and the pressure from an atmospheric to 75 psig.

Kadowaki et al (U.S. 4,365,087) discloses a process for producing acrylic acid by two stages :

- a. vapor-phase catalytic oxidation of propylene with a composite oxide catalyst expressed by the formula  $Mo_aBi_bNi_cCo_dFe_eNa_fMn_gB_hK_iSi_jO_x$
- b. specific reaction and operational conditions with the supply of oxygen.

Ishii et al (U.S. 4,365,087) discloses a catalytic process for producing unsaturated carboxylic acid by the gas phase catalytic oxidation of an unsaturated aldehyde with molecular oxygen at 240 to 450<sup>0</sup> C in the presence of a catalyst of the following formula:



Krabetz et al (U.S. 4,259,211) discloses a catalytic process for producing acrylic acid and methacrylic acid by the gas phase catalytic oxidation of acrolein and methacrolein with oxygen containing gases in the presence of  $Mo_{12}A_aB_bC_cD_dO_x$ .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to T. Victor Oh whose telephone number is (703) 305-0809. The examiner can normally be reached on Monday through Friday from 8:30 to 5:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alan Rotman, can be reached on (703) 308-4698. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4556.

*T. Victor Oh*  
11/10/02

*Alan L. Rotman*  
ALAN L. ROTMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1600